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EXAMINER

MAKI, STEVEN D

ART UNIT

PAPER NUMBER

1733

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17

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/588,407

Applicant(s)

BLACKMORE ET AL.

Examiner

Steven D. Maki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 18-25 is/are pending in the application.
- 4a) Of the above claim(s) 7-11 and 23-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 12-16 and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 12
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1) Newly submitted claims 23-25 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Originally elected claims 1-6, 12-19 and 20, drawn to heating device, apparatus for insitu repair of conduit, and method for repairing damaged section of conduit respectively, classified in class 156, subclass 294.
- II. New claims 23-25, drawn to method including "resistively heating said fibers by the electrical power source to cure the elastomeric matrix of the cylindrical body" *and* "resistively heating said fibers by the electrical power source to cure the prepreg", classified in class 264, subclass 405.

The inventions are distinct, each from the other because:

Inventions II and I are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination does not require the use of thermoset resin matrix, the fixedly attaching step, the positioning step, the inflating step or the deflating step. Alternatively: There is evidence that the particular characteristics of the subcombination are not essential to the combination.

Characteristics Asp ("resistively heating said fibers by the electrical power source to cure the elastomeric matrix of the cylindrical body") can be used as a basis for showing

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that Bsp (the use of thermoset resin matrix, the fixedly attaching step, the positioning step, the inflating step or the deflating step) does not constitute the sole distinguishing novelty in the combination. The subcombination has separate utility such as making a composite tube and placing the tube over a damaged pipe or joining the tube to the end of another tube.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Since applicant has received an action on the merits for the originally presented (and elected) invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 23-25 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

2) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3) Claims 12-16, 18-19 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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As to claims 12 and 22, it is unclear if these claims require electrical connection of the non-ferrous heating element and the power supply. If not, why not?

4) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Davies

5) **Claims 1, 3-6 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davies (US 5259901) in view of Hollingsworth (US 5266137).**

Davis et al discloses an inflatable mandrel (inflatable bladder) comprising a cured matrix material such as silicone elastomer and reinforcement fiber wherein the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The reinforcing fiber may be a graphite fiber. See col. 7 lines 47-50. In claims 1 and 21, the "nonmetallic, electrically conductive fibers" reads on the graphite fibers of Davis et al. Claims 1 and 21 contain a product by process limitation. In claim 1, for example, the product by process limitation is "said flexible matrix being cured to a stable elastomeric state by electric resistive heating of said fibers". This product by process language fails to require structure not shown by Davis et al. See MPEP 2113. In any event: It would have been obvious to provide the inflatable mandrel of Davis et al so as to satisfy ""said flexible matrix being cured to a stable elastomeric state by electric resistive heating of said fibers" (emphasis added) since Davis et al teaches curing the

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matrix material (e.g. the silicone elastomer) using an autoclave and using fibers such as graphite fibers.

As to claims 1, 3 and 21, it would have been obvious to one of ordinary skill in the art to use cable lines to connect the fibers (carbon fibers) of the inflatable mandrel of Davies et al to an electrical energy source so that the inflatable bladder can be heated by resistive heating and thereby cure the composite material during the use of the inflatable bladder in composite manufacture since (a) Davies et al teaches using the inflatable mandrel including wound fibers in composite manufacture wherein the composite is cured and (b) Hollingsworth, also directed to using a mandrel in composite manufacture, suggests supplying heat for curing composite material on a mandrel using resistive heating wherein carbon fibers molded in elastomer are used as the resistance heating elements (columns 9,10).

As to claims 4-6 and 21, note Davis et al's teachings regarding the reinforcing fiber. In any event: The limitation of the fibers being at ± 45 degrees (claim 4) / the 50-90% coverage (claim 5) would have been obvious in view of Davis et al's teaching that the fiber is incorporated in the elastomer using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows, bundles, or non-woven tape.

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6) **Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Davis et al (US 5,259,901) in view of Hollingsworth (US 5266137) as applied above and further in view of Europe '761 (EP 432761), Guenthner et al (US 5,216,085) or Rianda (US 4,792,374).**

As to claim 2, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder of Davis et al in view of Europe '761, Guenthner et al or Rianda – Europe '761 suggesting use of fluorosilicone for a bladder, Guenthner et al suggesting the use of fluorocarbon for a bladder and Rianda suggesting the use of fluorosilicone for a bladder.

Japan '334

7) **Claims 1-6, 12-13, 18-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 (JP 2-150334) in view of Japan '161 (JP 6-234161) or Japan '323 (JP 2-158323) and further in view of at least one of Davis et al (US 5259901), Wood et al (US 5,706,861), Hollingsworth (US 5266137) and Guenthner et al (US 5216085).**

Japan '334, directed to insitu pipe repair, discloses an apparatus for repairing a pipe using a repairing sleeve having curable adhesive comprising:

- an **inflatable heating device** comprising an expandable body 4 and a cylindrical cloth 7;
- a pressurized fluid conduit 11 and a hole 10 for inflating the expandable body 4 and the cloth 7;

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- an electric current feeding device, electrical wire 9 and metallic tapes 8, 8' to supply current to the cloth 7 so that the cloth 7 generates heat.

The following information was obtained from a PTO translator during a partial oral translation of Japan '334 (page 3, bottom left and top right): Expandable body 4 is comprised of an air tight layer 6 on the inner surface which is comprised a contractible resin or rubber and the cylindrical cloth using contracted thread. On both ends of the cylindrical woven cloth 7, a metallic tape 8, 8' is wound on the outer periphery and is attached. On this metallic tape 8, 8', positive and negative pole electric wire 9 respectively is provided and the tape is charged with a charging device not shown in the drawings. A covered yarn, whereby a polyethylene terephthalate compressed thread is wound, is used for the thread of the cylindrical woven cloth 7. The compressed thread is impregnated with a heated die below and is dried. With the heated die after a grafted polymerized acetylene is added and mixed and 50-60 parts to a urethane resin comprising the medium resin, it is absorbed in a methyl ethyl ketone. Regarding the conductive additive, metal powder and carbon black have been considered, but in terms of processing cost and controlling properties, carbon is preferable. Among the conductive additives, the graft polymerized acetylene black is preferable because acetylene black is excellent in dispersion into a medium. Therefore a uniform resistor is obtained. Also, because excess current which flows locally does not cause heating, there is no danger of burning and safety is significant.

Hence: **Japan '334 discloses resistively heating an inflatable heating device for insitu pipe repair using electrically conductiv non-metallic threads and**

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thereby substantially discloses the claimed invention. Japan '334 does not appear to recite embedding the electrically conductive fibers nonmetallic in the expandable body.

As to claims 1, 12 and 21, it would have been obvious to one of ordinary skill in the art to embed the electrically conductive non-metallic fibers, which are to be resistively heated, in the expandable body of the inflatable heating device of Japan '334 in view of (a) Japan '161's teaching to embed an electrically conductive element, which is to be resistively heated, in an expansion tube or (b) Japan '323's teaching to embed electrically conductive wires, which are to be resistively heated, in a heater tube comprising a film 4 and a tube 2. Japan '334, Japan '161 and Japan '323 are in the same field of endeavor - lining / repairing a pipe and share the common subject matter of supplying heat during repair / lining of a pipeline using resistive heating.

As to the elastomeric matrix, one of ordinary skill in the art would readily understand that the rubber described by Japan '334 for the flexible expandable body 4 is a cured elastomer. In any event: it would have been obvious to one of ordinary skill in the art to use an cured elastomeric / thermoset resin matrix such as silicone for Japan '334's bladder since cured elastomeric / thermoset resin matrix such as silicone matrix is a well known / conventional material per se for an inflatable bladder as evidenced by at least one of Davis et al (e.g. cured rubber / cured silicone elastomer / cured urethane at col. 6 lines 43-53, abstract), Wood et al (silicone at col. 4), and Hollingsworth (silicone at col. 9), and Guenther et al (fluorocarbon at abstract, col. 2). In other words, the use of cured elastomeric / thermoset resin for the bladder is suggested by and is nothing

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more than the use of the usual material used for bladders as evidenced by at least one of Davis et al, Wood et al, Hollingsworth and Guenther et al. Davies et al specifically teaches that the cured matrix of the bladder contains fibers. Wood et al specifically teaches the use of silicone for a bladder used in the art of lining / repairing pipes. Hollingsworth contains the additional teaching of the use of carbon fibers for resistive heating. Guenther et al suggests the specific material set forth in claims 2 and 13.

As to product by process language (claim 1), the product by process limitation of "said flexible matrix being cured to a stable elastomeric state by electric resistive heating of said fibers" fails to require structure (composition / state of cure) not suggested by the at least one of Davis et al, Wood et al, Hollingsworth and Guenther et al. In other words, each of these secondary references suggest cured material for a bladder.

As to the electrical cable lines (claim 1), this subject matter is suggested by Japan '334 which suggests supplying current to the opposite ends of the conductive cloth using wires.

As to claim 2, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder in view of Guenther et al's suggestion to use fluorocarbon for a bladder.

As to claim 3, it would have been obvious to use carbon fibers in Japan '334's inflatable heating device since Hollingsworth, directed to a mandrel having an inflatable support (bladder), teaches that carbon fibers may used as resistance heating elements (column 10).

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As to claims 4-6 and 21 (helically arranged fibers), it would have been obvious to incorporate the fibers in the bladder using winding since Davis et al suggests incorporating fibers in elastomer of a bladder using hoop winding, helical winding and/or polar winding. The limitation of the fibers being in the form of tows or bundles (claim 5) or the fibers being in the form of non-woven tape (claim 6) would have been obvious since (a) Davis et al teaches the use of reinforcing fibers and (b) it is taken as well known / conventional per se in the composite art to wind fibers which are in the form of tows or bundles.

As to claim 6, it would have been obvious to provide the fibers in the form of a non-woven tape since (a) Japan '334 suggests using fibers and (b) fibers in the form of non-woven tape for use for example in a woven cloth are taken as well known / conventional per se.

As to claim 12, the limitation of the claimed air port and a vacuum port would have been obvious in view of (a) Japan '334 teaching to use a pressurized fluid conduit to supply pressurized fluid and to discharge pressurized fluid and (b) it is taken as well known / conventional in the lining art to provide an air port for communication with a compressed air source for inflating a bladder and a separate vacuum port for communicating with a vacuum source for deflating the bladder.

As to claim 13, it would have been obvious to use fluorosilicone or fluorocarbon for the matrix of the bladder in view of Guenthner et al's suggestion to use fluorocarbon for a bladder.

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As to claims 18 and 19, the subject matter in these claims is suggested by the above applied prior art which includes Davies et al - Davies et al clearly suggesting using wound fibers in an inflatable bladder. *It is noted that claims 18 and 19 fail to require the temperature tolerant fiber windings and the electrically conductive fiber windings to comprise different materials.*

8) **Claims 4-6, 14-16, 18-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 in view of Japan '161 or Japan '323 and further in view of at least one of Davis et al, Wood et al, Hollingsworth and Guenther et al as applied above and further in view of at least one of Baker et al (US 4191383), Rankin (US 1362351) and Renaud (US 4861634).**

As to claims 4-6, 18-19 and 21, it would have been obvious to provide the electrically conductive fibers in the bladder as braided fibers since in view of Baker et al's suggestion to use braided material in a bladder which like that of Japan '334 is inflatable. *Claims 4-6, 18-19 and 21 read on the fibers being braided.*

As to claims 14-16, it would have been obvious to use the claimed braided fibers in Japan '334's inflatable heating device in view of (a) Baker et al's suggestion to use braided material in a bladder which like that of Japan '334 is inflatable and/or (b) Rankin's teaching to use braided fibers as a heating element.

It is noted that claims 14-16 and 18-19 fail to require the temperature tolerant fiber windings and the electrically conductive fiber windings to comprise different materials. In any event: it would have been obvious to one of ordinary skill in the art to use temperature tolerant fibers and electrically conductive fibers in view of (a) Renaud's

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teaching to one of ordinary skill in the pipelining / pipe repairing art to use a combination of reinforcing fibers such as glass fibers and conductive wires for resistively heating in a lining material and (b) Rankin's teaching to use non-conducting filaments with a conductor in a heating element which is to be resistively heated.

9) **Claims 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan '334 in view of Japan '161 or Japan '323 and further in view of at least one of Davis et al, Wood et al, Hollingsworth and Guenthner et al as applied above and further in view of Lippiatt (US 5,199,463).**

As to claims 20 and 22, it would have been obvious to removably attach a pre preg comprising fibers and thermosetting resin since Lippiatt, also directed to repairing pipelines, suggests removably attaching lining material in the form of a pre-preg (fibrous material impregnated with heat curable resin) to a bladder using loose ties.

Remarks

10) Applicant's arguments with respect to claims 1-6, 12-16 and 18-22 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 6-9-03 have been fully considered but they are not persuasive.

As to applicant's arguments regarding Davies et al, note the 103 rejection over Davies et al in view of Hollingsworth.

Applicant's argument that there is no incentive to combine Barton with Japan '323 and Japan '334 is moot in view of the new ground of rejection which uses Japan '334 as the primary reference but which does not use Barton.

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Applicant argues that Japan '334 does not disclose "nonmetallic electrically conductive fibers". Applicant is incorrect since Japan '334 (now the primary reference) expressly teaches using a polyethylene terephthalate (polyester) thread containing conductive carbon black. Applicant's comment regarding the use of metallic tapes is irrelevant since the use of such metallic tapes to electrically connect the electrically conductive non metallic fibers of the cloth and the electrical wire is not excluded by any of the claims.


11) No claim is allowed.

12) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is 703-308-2068. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (703) 308-3853. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Steven D. Maki
October 6, 2003


STEVEN D. MAKI
PRIMARY EXAMINER
~~GROUP 1300~~
A~ 1733
10-6-03